CLAIMS

1. A method of monitoring physiologic signals produced by a live body organ comprising the steps of:

(a) positioning a plurality of physiologic signal sensors at different positions in relation to an area of said live body organ for providing multivariant physiologic signals of different but not independent character;

(b) inputting said physiologic signals to a data processor that performs the steps of

(c) converting said physiologic signals to derive desired data for monitoring changes and identifying timing of events relating to said live body organ under examination, said derived data being based upon multidimensional analysis of other data to derive said desired data.

2. The method of claim 1 further comprising the step of generating a voltage spike or flag used to trigger imaging systems.

3. The method of claim 1 wherein said derived new data includes a voltage offset of a segment of a waveform of continuous data, used to identify the presence of or changes in ischemia, expressed as a voltage offset.

4. The method of claim 1 wherein said derived data includes a voltage offset of a segment of a waveform of continuous data, and further comprises the step of identifying the presence or changes in ischemia, expressed as a series of voltage spikes that count out the segment deviation in millimeters or tenths of millivolts.

5. The method of claim 1 wherein said derived data includes representations of a respiratory cycle derived from baseline undulations in EKG signals.

6. The method of claim 1 further comprising the step of using sensors of magnetic gradient switching as reference data to eliminate or isolate their contribution to signals.

7. The method of claim 1 further comprising the step of using data derived from other data and/or variance to define a multivariate volume about desired signals to separate desired from undesired signals.

8. The method of claim 1 further comprising the step of using derived timing triggers to compute and/or forecast comparable filling periods to in turn identify times for comparable positions for image collection or other action, despite the presence of disturbed rhythms.

9. The method of claim 1 wherein said live body organ comprises a heart.

10. Method of performing diagnostic testing of the heart and for enhancing the clarity of a display of features of interest, relating to evaluating the health of a patient's heart under examination, comprising the steps of:

(a) positioning a set of multiple electrical pickup devices in relation to the patient's skin for producing multivariant data of the electrical activation of said heart;

(b) applying said multivariant data to a data processor, which responds to receipt of said multivariant data; and

(c) comparing said multivariant data with training data to derive descriptive values that are applied to template components, and generating synthetic composite ECG electrographic data in an easily understood view, indicating various heart conditions where such heart conditions may include the nature and/or timing of P waves,

QRS waves, ST segment deviation, T waves, and/or respiratory motion.

11. The method of claim 10 further comprising the step of substantially reducing an artifact produced by aortic pulsations that can interfere with clear readings of said synthetic composite ECG electrographic data.

12. The method of claim 11 further comprising the step of analyzing said multivariant data by a low frequency curve fit or filter to extract the respiratory baseline artifact and subtract it to produce a flattened baseline.

13. The method of claim 10 further comprising the step of superimposing upward trigger spikes upon R wave heights for ensuring that legacy R-wave detectors for following timing of the electrical activation of large chambers of the heart.

14. The method of claims 11 further comprising the step of superimposing upward trigger spikes upon R wave heights for ensuring that legacy R-wave detectors for following timing of the electrical activation of large chambers of the heart.

15. The method of claim 12 further comprising the step of superimposing upward trigger spikes upon R wave heights for ensuring that legacy R-wave detectors for following timing of the electrical activation of large chambers of the heart.

16. The method of claim 10 further comprising the steps of:

determining if said multivariate data fits constraints which define limits of acceptable variations relating to one or more of the following: noise spikes, scaled channel, aberrant heart beats or otherwise unreliable data; and

editing said multivariate data to cause said multivariate data to fit the constraints if said multivariate data does not fit.

17. The method of claim 11 further comprising the steps of:

determining if said multivariate data fits constraints which define limits of acceptable variations relating to one or more of the following: noise spikes, scaled channel, aberrant heart beats or otherwise unreliable data; and editing said multivariate data to cause the data to fit the constraints if said multivariate data does not fit.

18. The method of claim 12 further comprising the steps of:

determining if said multivariate data fits constraints which define limits of acceptable variations relating to one or more of the following: noise spikes, scaled channel, aberrant heart beats or otherwise unreliable data; and editing said multivariate data to cause the data to fit the constraints if feasible if said multivariate data does not fit.

19. The method of claim 18 further comprising the steps of:

comparing said multivariate data to training data to identify desired features for display which can include production of P-wave, R-wave, ST-segment, T-wave, respiratory phase from baseline artifact, and wave morphologies, and wherein said training data can represent the features of interest, expected ranges of values and covariance as a function of time, and expected signal disturbances; and

displaying said composite ECG electrographic data in response to a favorable comparison.

20. The method of claim 11 further comprising the steps of:

comparing said multivariate data to training data to identify desired features for display which can include

production of P-wave, R-wave, ST-segment, T-wave, respiratory phase from baseline artifact, and wave morphologies, and wherein said training data can represent the features of interest, expected ranges of values and covariance as a function of time, and expected signal disturbances; and

displaying said composite ECG electrographic data in response to a favorable comparison.

21. The method of claim 12 further comprising the steps of:

comparing said multivariate data to training data to identify desired features for display which can include production of P-wave, R-wave, ST-segment, T-wave, respiratory phase from baseline artifact, and wave morphologies, and wherein said training data can represent the features of interest, expected ranges of values and covariance as a function of time, and expected signal disturbances; and

displaying said composite ECG electrographic data in response to a favorable comparison.

22. The method of claim 16 further comprising the steps of:

comparing said multivariate data to training data to identify desired features for display which can include production of P-wave, R-wave, ST-segment, T-wave, respiratory phase from baseline artifact, and wave morphologies, and wherein said training data can represent the features of interest, expected ranges of values and covariance as a function of time, and expected signal disturbances; and

displaying said composite ECG electrographic data in response to a favorable comparison.

23. Apparatus for monitoring physiologic signals produced by a live body organ, comprising:

(a) a plurality of physiologic signal sensors, said sensors being placed at different positions in relation to said live body organ to provide multivariant physiologic signals of different but not independent character;

(b) data processing means coupled to said signal sensors for converting said physiologic signals to derive a composite set of desired data more reliable for purposes of monitoring changes and identifying timing of events relating to said live body organ under examination, derivation of said desired data being based upon multidimensional modeling of observed data in comparison to training data

24. The apparatus of claim 23 wherein said coupling comprises a plurality of pairs of twisted electrically conductive leads, each pair being associated with a corresponding sensor, and a first lead of each pair being in electrical contact with a particular signal sensor and a second lead of each pair being electrically disconnected from said particular signal sensor but terminated adjacent thereto.

25. The apparatus of claim 23 wherein each sensor makes electrical contact with a skin portion of a patient under examination.

26. The apparatus of claim 24 wherein each sensor makes electrical contact with a skin portion of a patient under examination.

27. The apparatus of claim 23 wherein said desired data is generated by applying derived descriptive values to template elements.